Yacovone, Krista

From: DiPippo, Gary <Gary.DiPippo@Cornerstoneeg.com>
Sent: Monday, August 26, 2013 12:20 PM
To: Gorin, Jonathan
Cc: jmhoffman@ashland.com; Carrie McGowan; MacMillin, Scott
Subject: RE: draft power points
Attachments: LCP Presentation(CEG comments).pptx

The attachment

From: DiPippo, Gary
Sent: Monday, August 26, 2013 12:17 PM
To: 'Gorin, Jonathan'
Cc: jmhoffman@ashland.com; Carrie McGowan; MacMillin, Scott
Subject: RE: draft power points

Jon,

I've been through the slides, and annotated a few comments in the attached. For the most part I was looking at these for consistency with the FS (e.g., you indicate 6" cap treatment layer, and the FS says 3" (which by the way is much more than indicated by stoichiometry).

In any event, the comments should show up in the upper left hand corner of the slide, you click on it to read.

I'm sending this first, because it's a big file. If you don't get the attachment shortly, let me know.

Thanks, Gary

From: Gorin, Jonathan [mailto:Gorin.Jonathan@epa.gov]
Sent: Monday, August 26, 2013 11:09 AM
To: jmhoffman@ashland.com; Carrie McGowan; MacMillin, Scott; DiPippo, Gary
Subject: draft power points

Good morning, attached is a draft of the power points I'll be using Wed. They're a bit cryptic without the presentation….

There are also a lot of them, but many I plan on showing only for a couple of seconds to stress a point (e.g., yes we did consider/screen a lot of soil options). I figure it will take me 30 minutes for the talk.

Please let me know if there are any issues or points you think I should add/stress.

Thanks, jon

LCP Chemicals Inc., Superfund Site Public Meeting
August 28, 2013 – 7:00 pm

Agenda

Introduction:…….Natalie Loney, EPA

Overview:…….Jon Gorin, EPA

- Superfund Process
- Site History
- Remedial Investigation
- Feasibility Study – Alternatives
- Preferred Alternative

Questions

Superfund Process

- Site Discovery/Preliminary Assessment/Site Investigation
- Site Added to National Priorities List
- Remedial Investigation (Risk Assessments)
- Feasibility Study (Evaluate Alternatives using the “Nine Criteria”)

The Nine Criteria for Remedy Evaluation

A: Threshold Criteria:

1) Overall Protection of Human Health and the Environment
2) Compliance with State and Federal Regulations

B - Balancing Criteria:

3) Long Term Effectiveness – Permanence
4) Reduction of Toxicity, Mobility or Volume
5) Short-term Effectiveness
6) Implementability
7) Cost

C - Modifying Criteria:

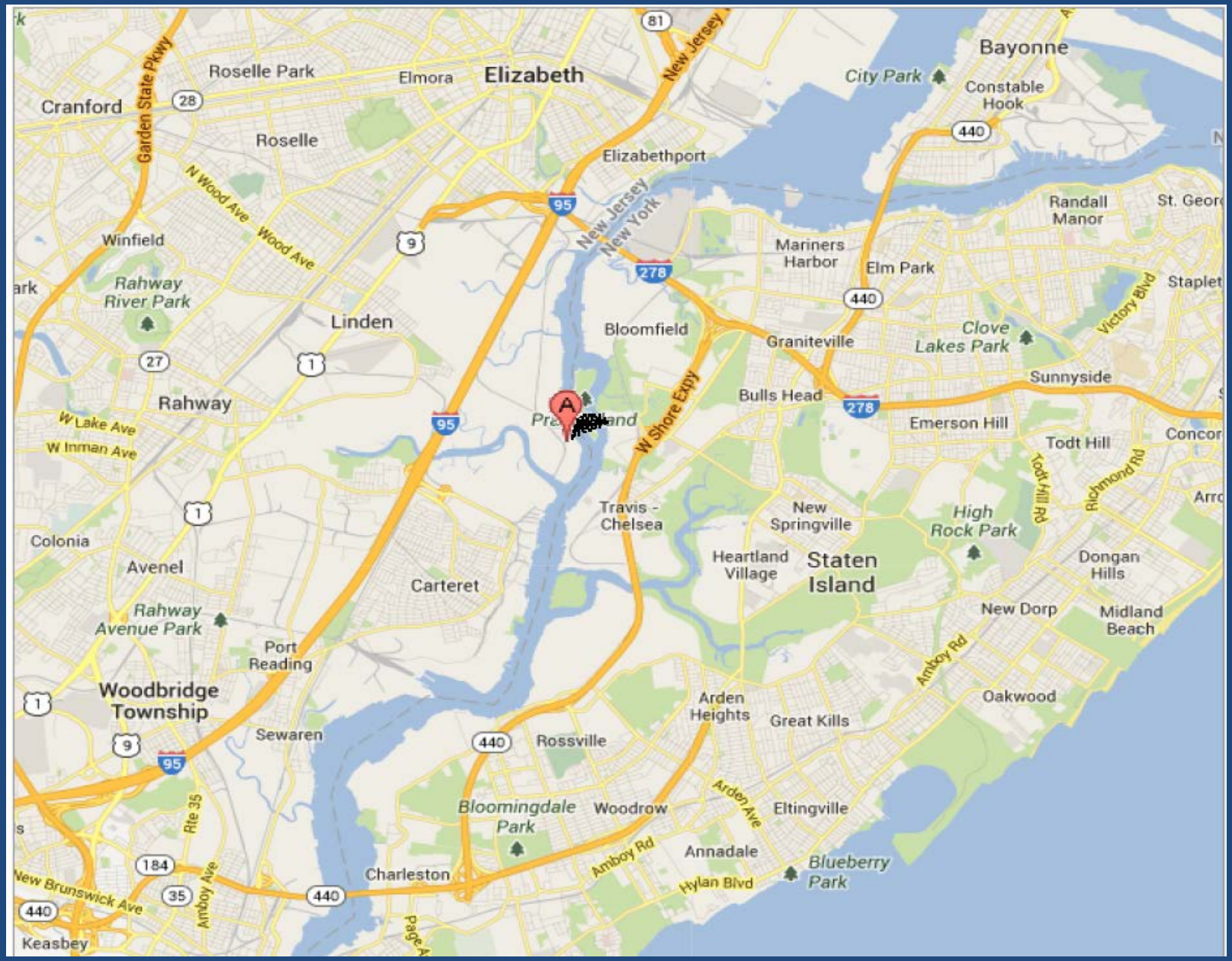
8) Support Agency Concerns
9) Community Concerns

Superfund Process (cont.)

- Remedy Proposed
  (Proposed Plan/Public Comment Period)
- Remedy Selected
  (Record of Decision)
- Design
- Action

Site Background

- **26 Acres**
- **Wetlands filled prior to 1955**
- **Chlor-alkali production 1955-1985**
- **Site currently unoccupied and surrounded by locked gated fence.**


Bayonne
City Park
Constable Hook
Roselle Park
Elmora
Elizabeth
Cranford
Garden State Pkwy
Roselle
Elizabethport
N Wood Ave
Wood Ave
Winfield
Rahway River Park
Linden
New Jersey
New York
Mariners Harbor
Elm Park
Randall Manor
Bloomfield
Graniteville
Clove Lakes Park
Victory Blvd
Sunnyside
Bulls Head
Emerson Hill
Todt Hill
Rahway
W Lake Ave
W Inman Ave
W Shore Expy
Travis - Chelsea
New Springville
High Rock Park
Todt Hill Rd
Richmond Rd
Colonia
Avenel
Carteret
Heartland Village
Staten Island
Dongan Hills
Rahway Avenue Park
Port Reading
New Dorp
Midland Beach
Amboy Rd
Woodbridge Township
Arden Heights
Great Kills
Oakwood
Sewaren
Rossville
Bloomingdale Park
Woodrow
Arden Ave
Eltingville
Rte 35
Annadale
Blueberry Park
Hylan Blvd
Charleston
New Brunswick Ave
Amboy Ave
Keasbey
Page Ave

Mercury Cell Process

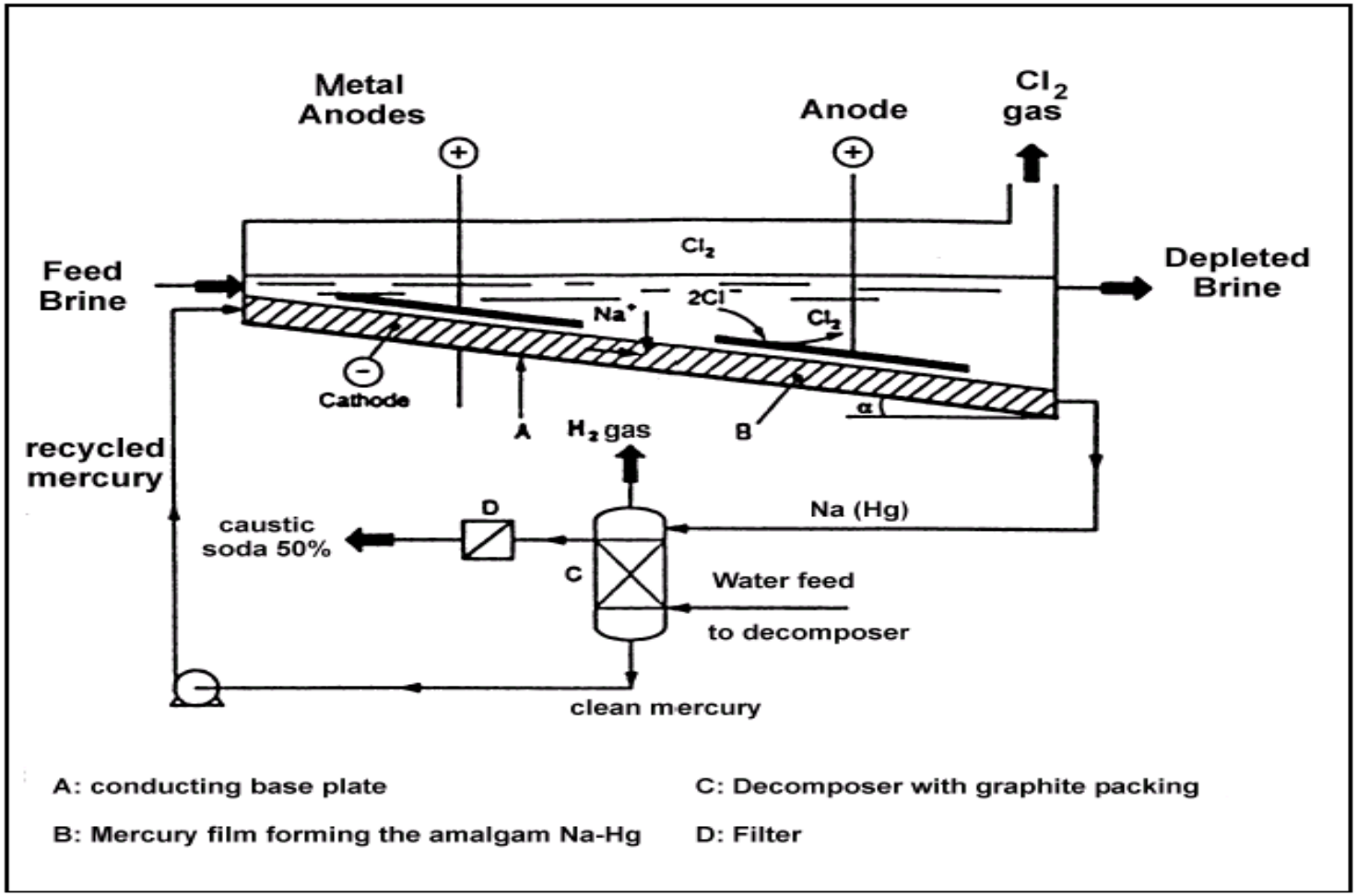
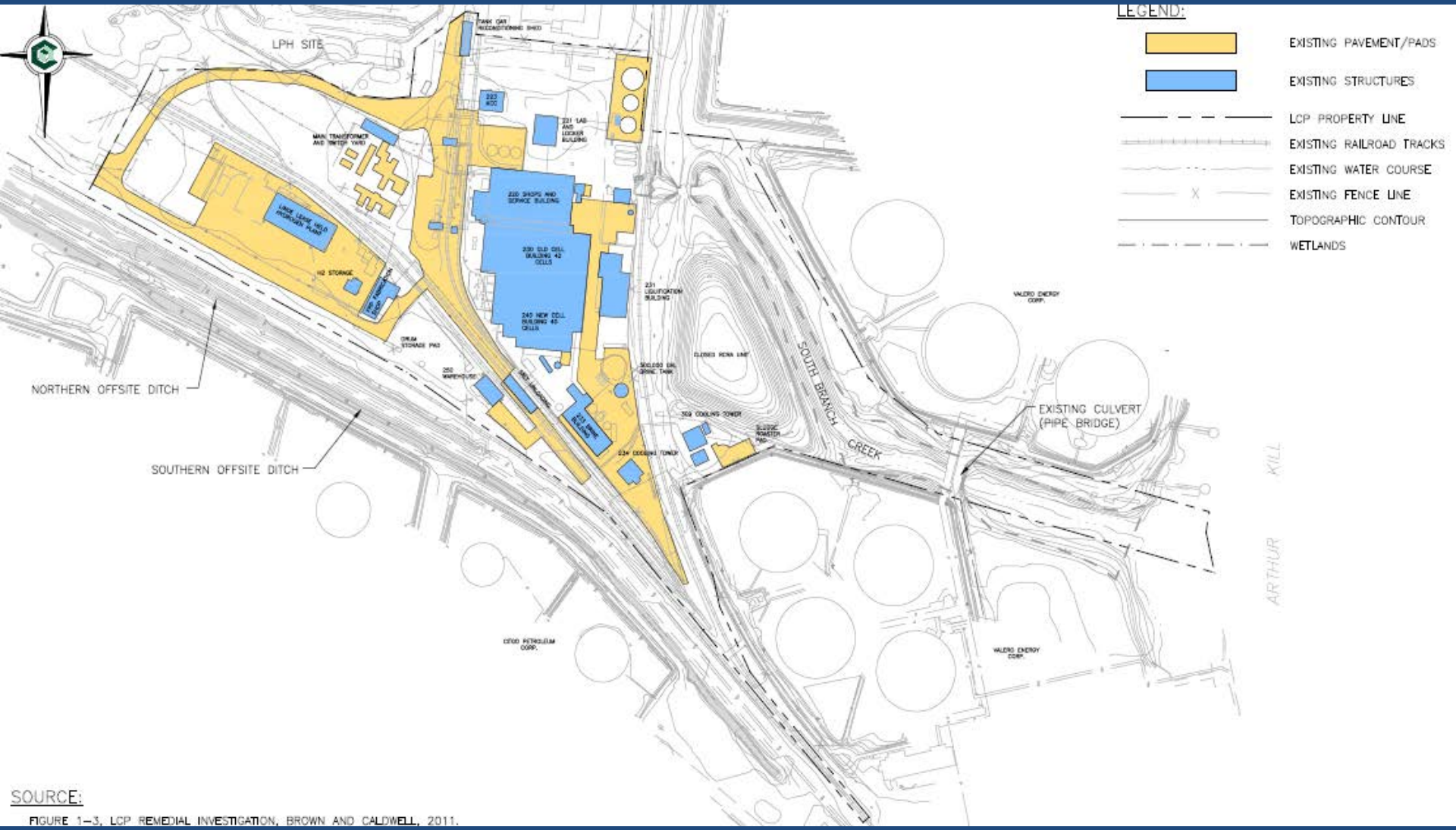


Figure 2.3: Flow diagram of mercury cell technology



SOURCE:

FIGURE 1-3, LCP REMEDIAL INVESTIGATION, BROWN AND CALDWELL, 2011.

Tremley Point 1940

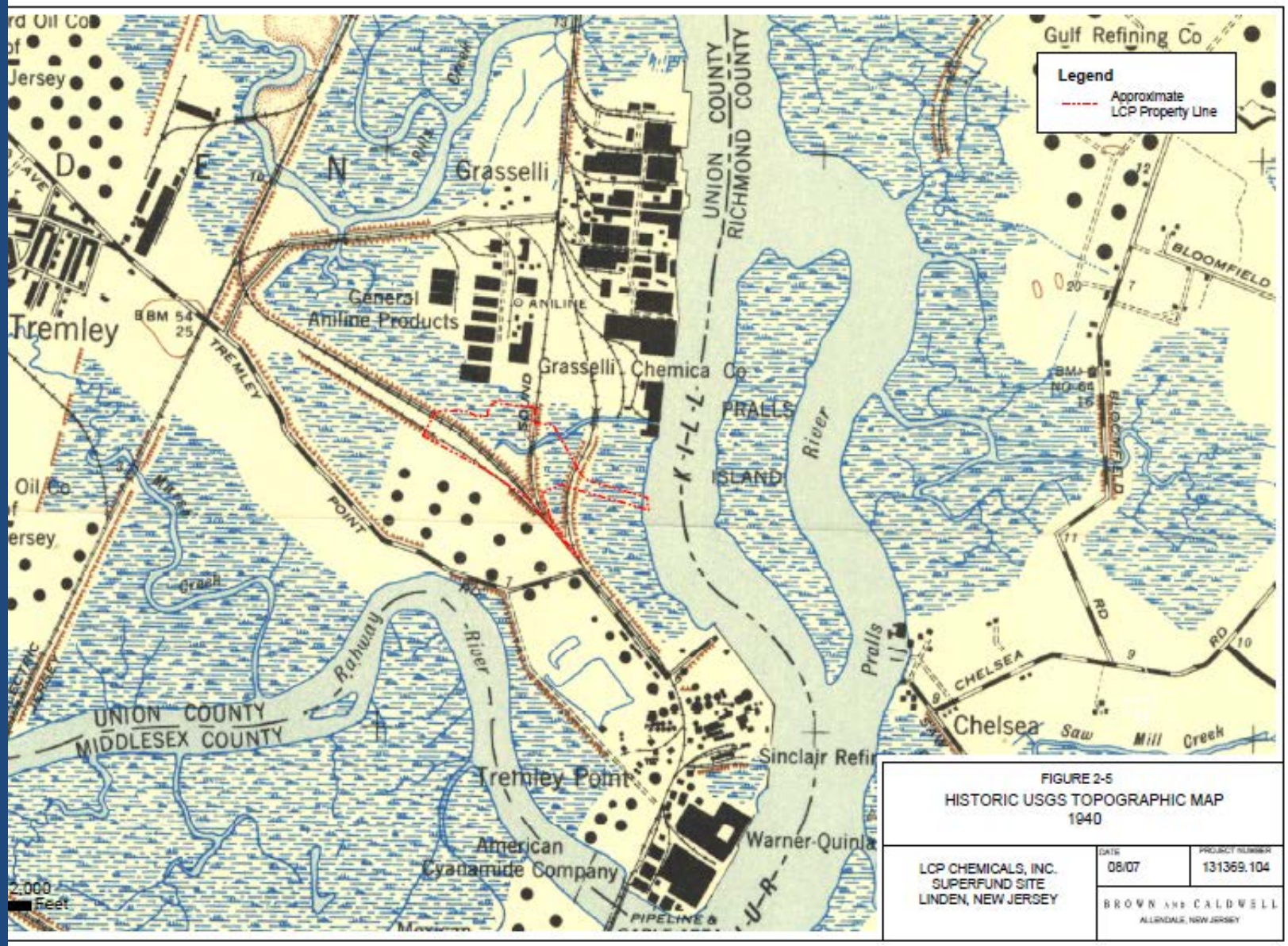


FIGURE 2-5
HISTORIC USGS TOPOGRAPHIC MAP
1940

LCP CHEMICALS, INC. SUPERFUND SITE LINDEN, NEW JERSEY	DATE 08/07	PROJECT NUMBER 131369.104
	BROWN AND CALDWELL ALLENDALE, NEW JERSEY	

Tremley Point Rd
S Wood

Media to Be Addressed

- Soil
- Sediments
- Groundwater
- Building Material

Soils

GEOLOGIC UNITS

Anthroprogenic FILL –

- An irregular mixture of soils ranging from gravel to clay size particles; consists primarily of soil but is characterized by the frequent presence of anthropogenic materials, including ash, wood fragments, bricks, and glass
- Ranges in thickness from 0.7 to 17 feet

TIDAL MARSH DEPOSITS –

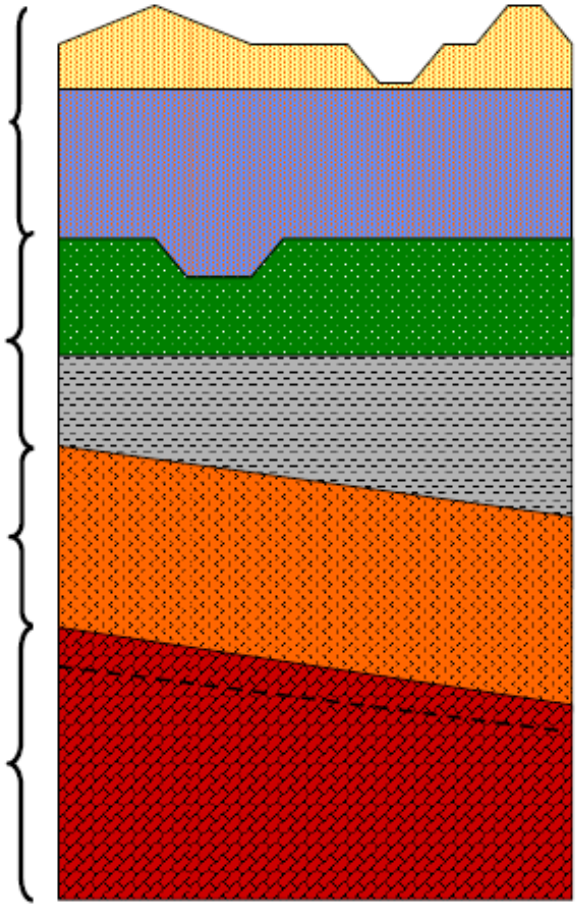
- Peat - brown to black, loose, fibrous, very soft, and water-saturated
- Organic Silt and Clay - Gray to black SILT to CLAY, none to some fine Sand
- Ranges in thickness from 7.8 to 10 feet

GLACIAL TILL –

- Red-brown SILT & CLAY to CLAY & SILT, none to some fine-medium Gravel, none to little fine to fine-medium-coarse Sand
- Ranges in thickness from 18.5 to 20.5 feet

PASSAIC Formation –

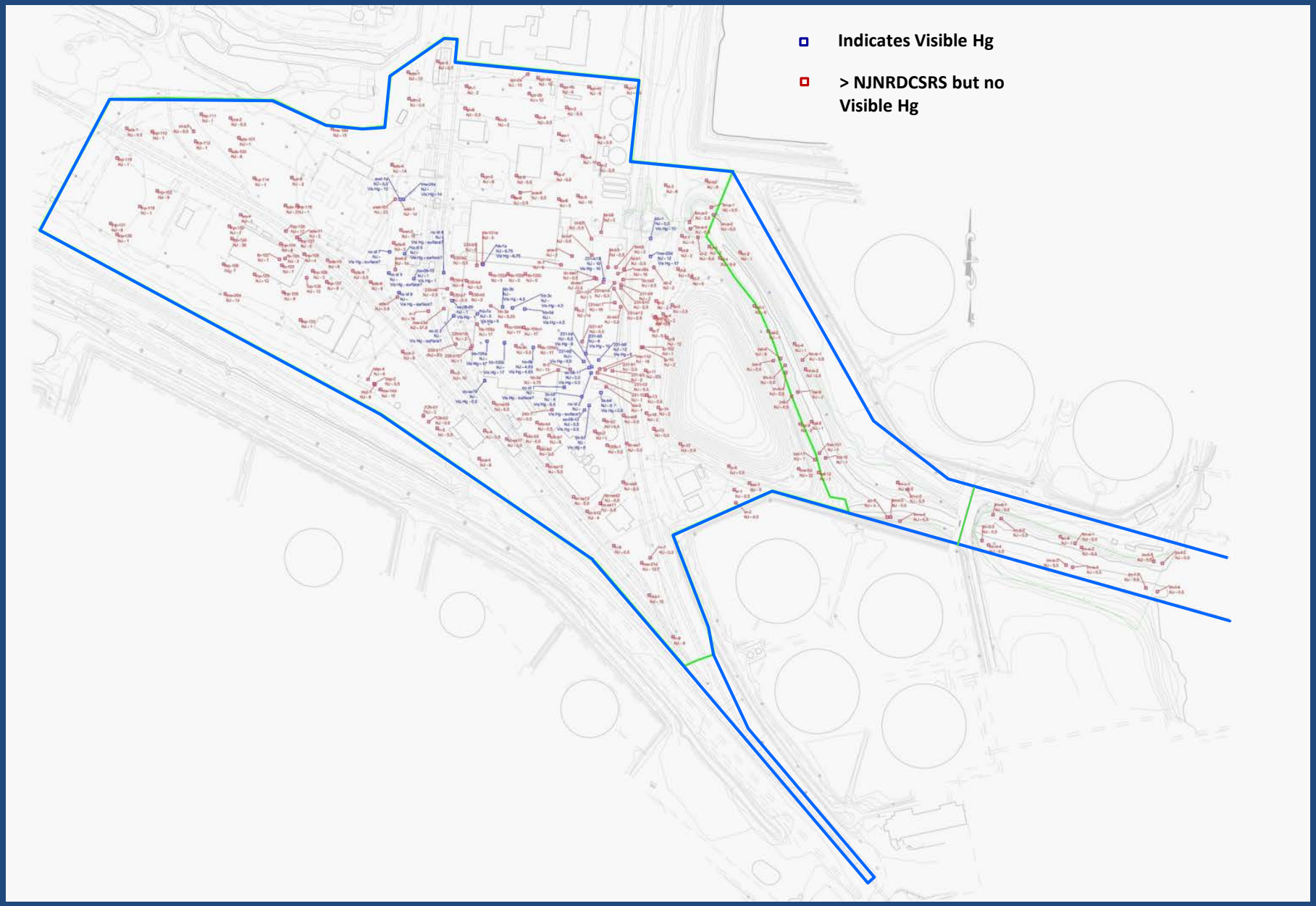
- Residual Soil – the result of in place decomposition of the underlying bedrock
- Competent Bedrock - Shale that resists penetration (refusal) by a split-tube sampler is described as competent
- Top of the Passaic formation is observed to range between -20 and-40 feet NGVD



Soil Contamination

- The soil contaminants include mercury, arsenic, PCBs, PAHs and VOCs.
- Due to its persistence, toxicity and mass, Hg is the site's primary contaminant of concern.
- The soils with "visible" mercury (~24,000 cu yds) are principal threat wastes (PTW).

Soils with Hg > NJ Non-Residential Std (65 mg/kg)



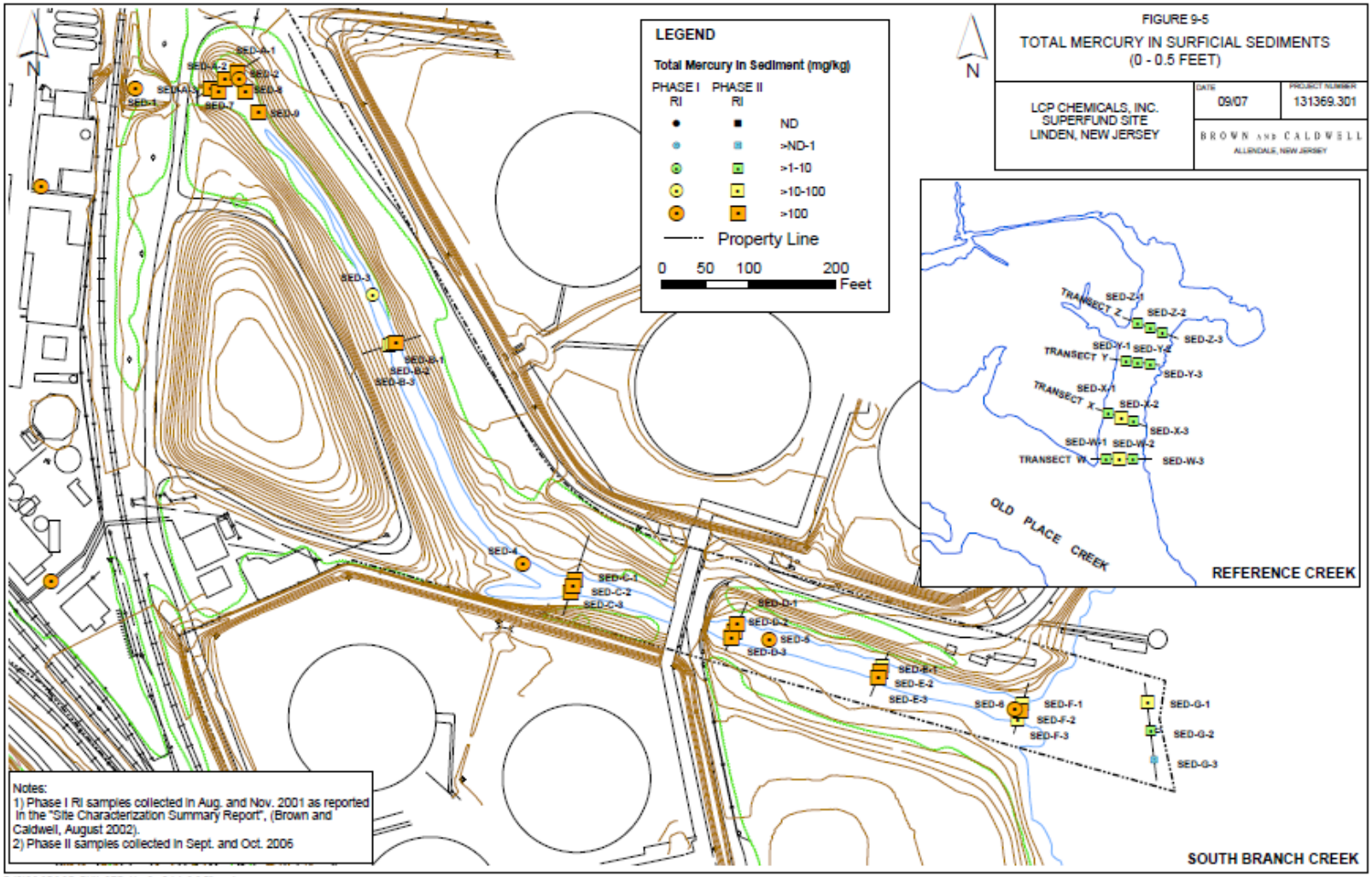
South Branch Creek

Sediments

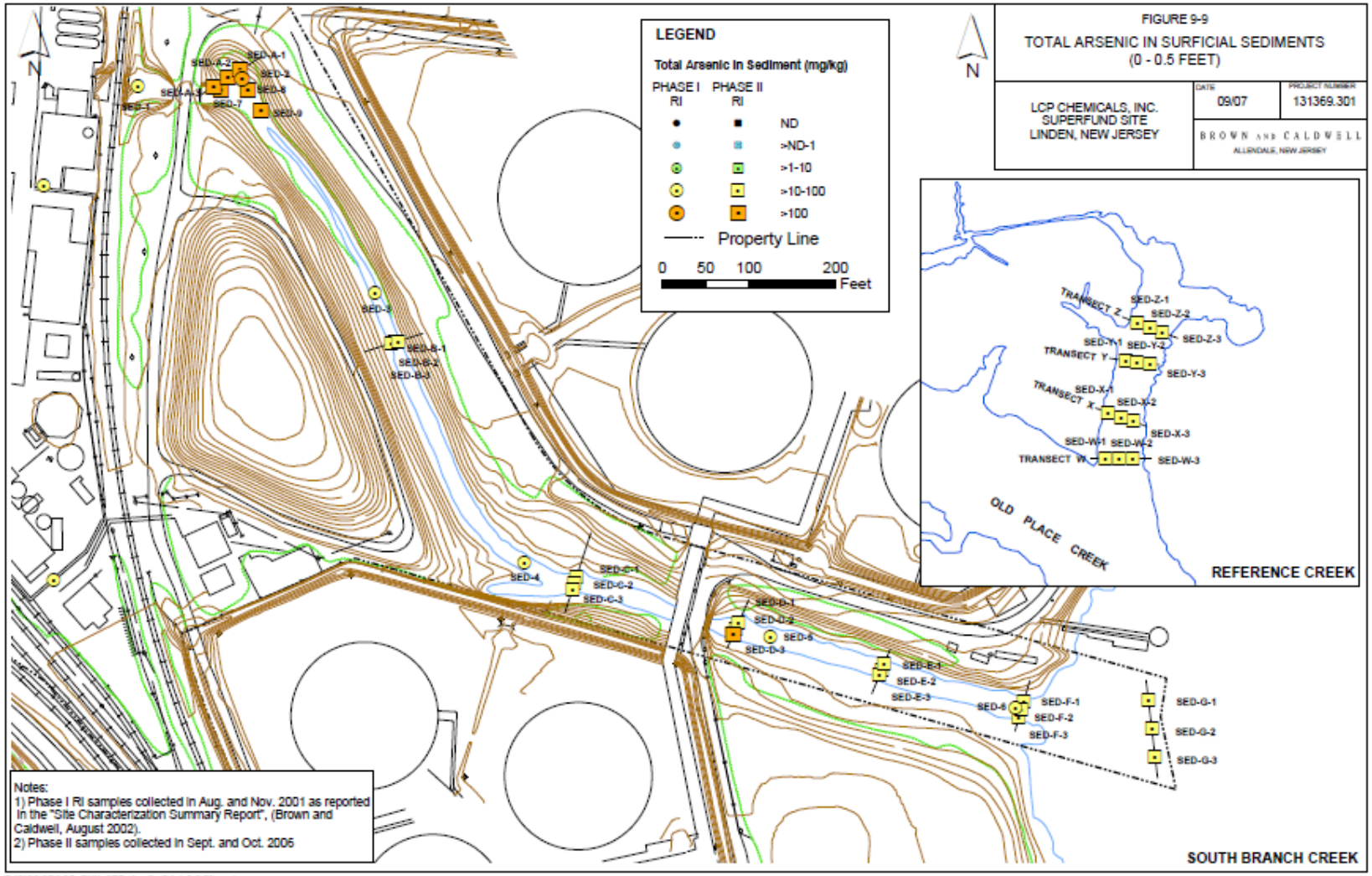
- Contaminants in South Branch Creek sediments include Mercury, Barium, PCBs, and Arsenic.

- Mean concentration of mercury is 196 mg/kg, with a high concentration of 900 mg/kg.

Mercury in SBC Sediments 0-0.5’



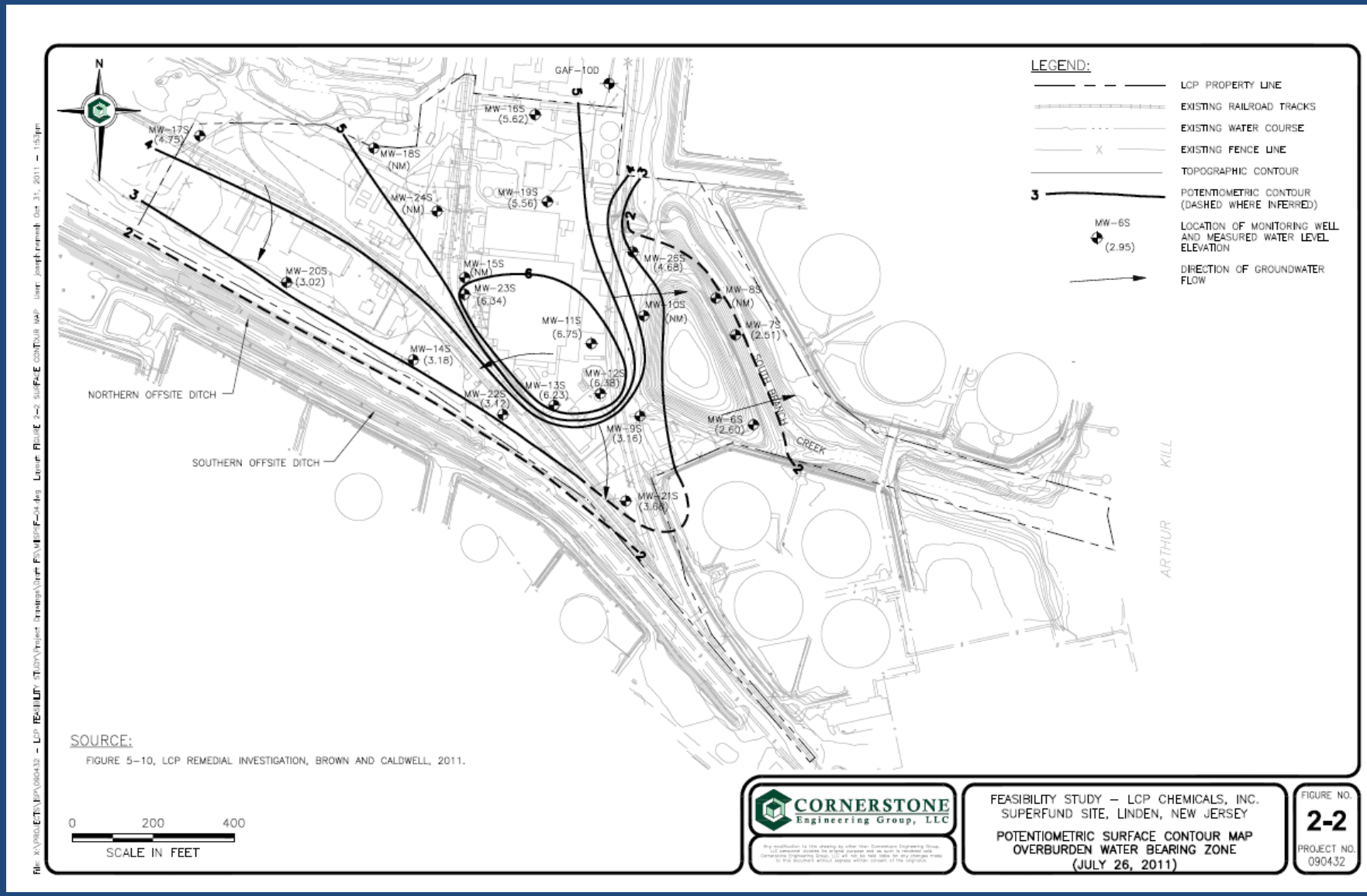
Arsenic in SBC Sediments 0-0.5’



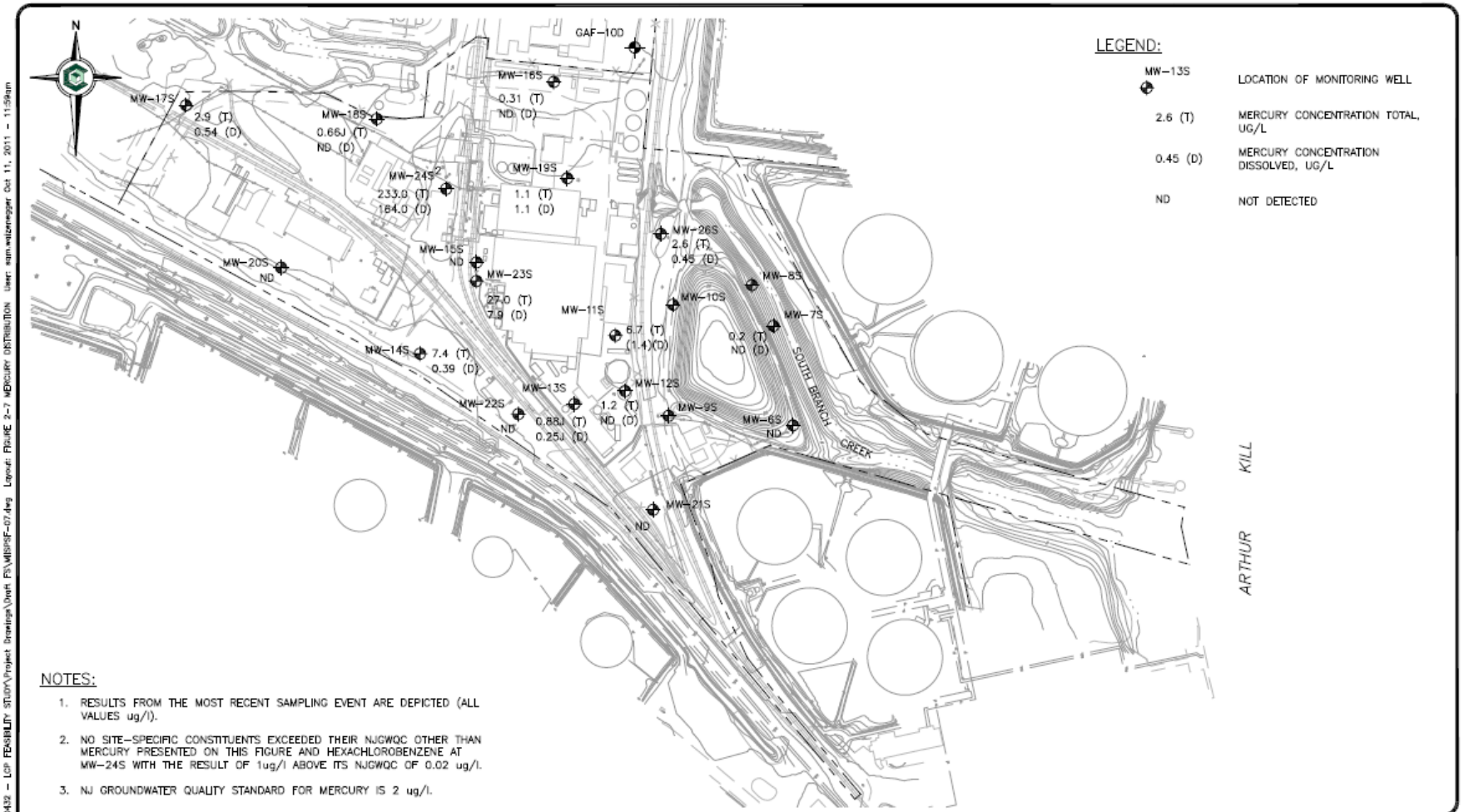
Groundwater

- Groundwater is found in two layers separated by silt/clay.
- The shallower layer “overburden zone” is within the fill and upper peat subunit of the tidal marsh deposits.
- The deeper layer “bedrock zone” is within the upper portion of the bedrock.

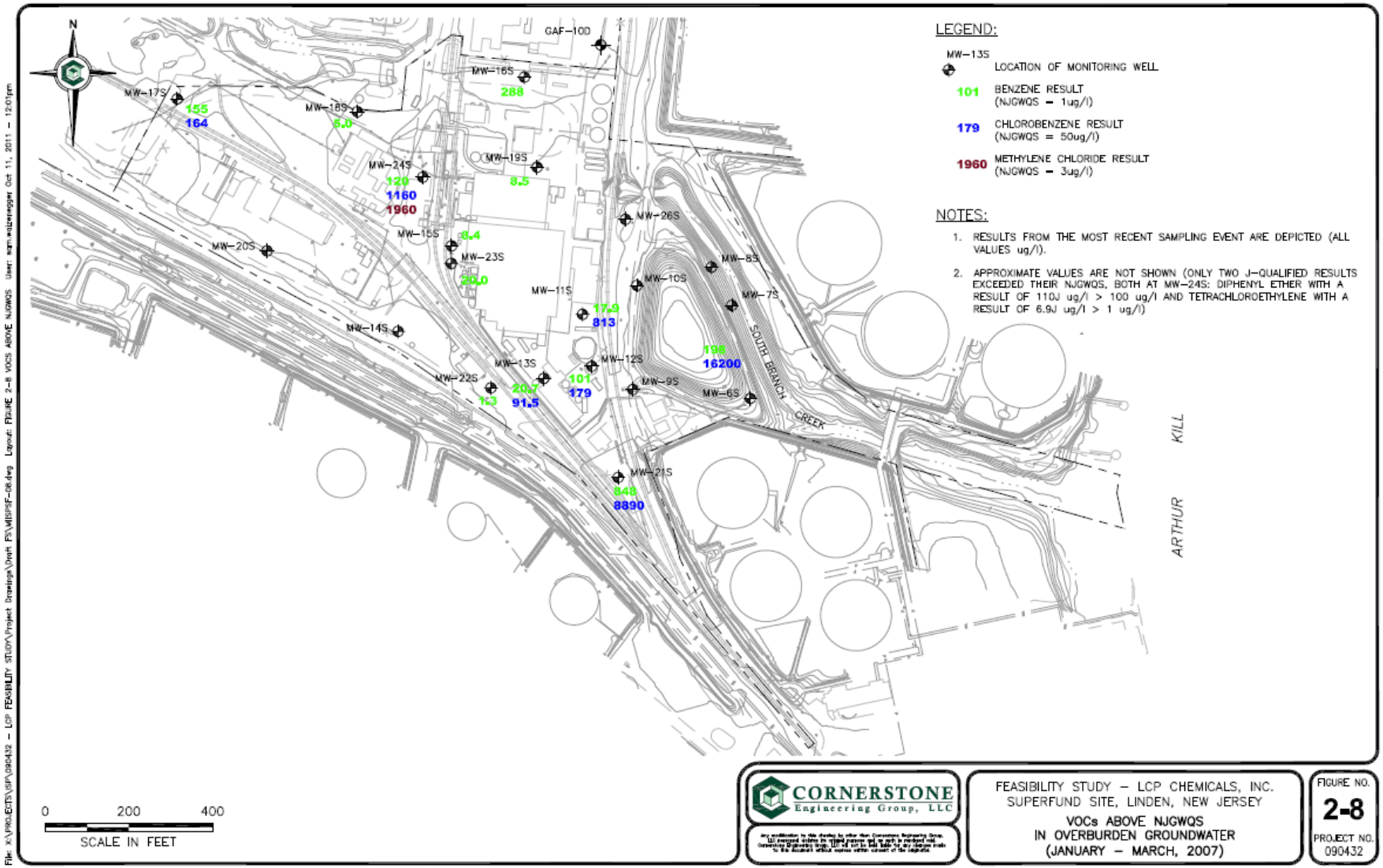
Overburden Groundwater Flow



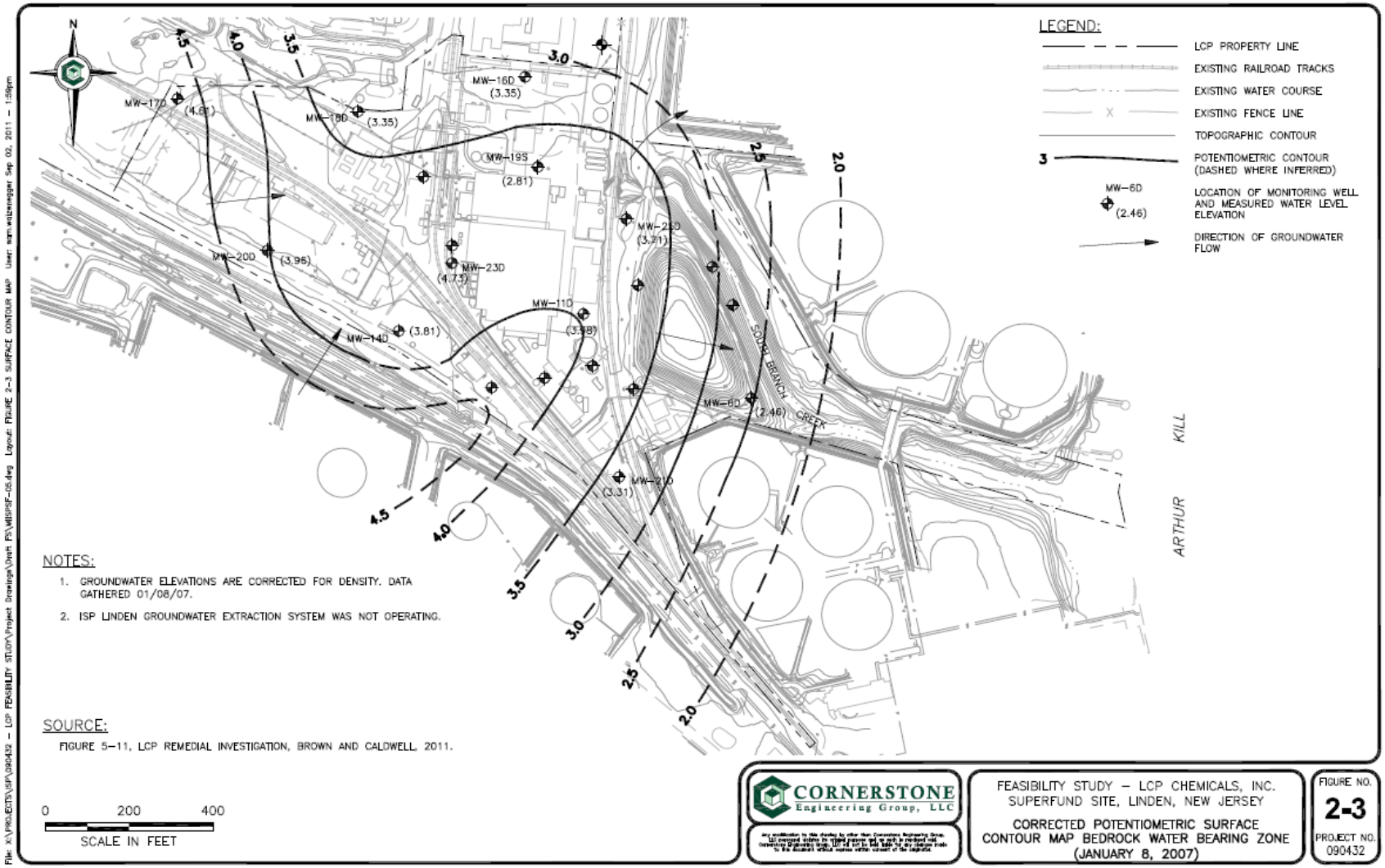
Overburden Groundwater Hg Concentrations



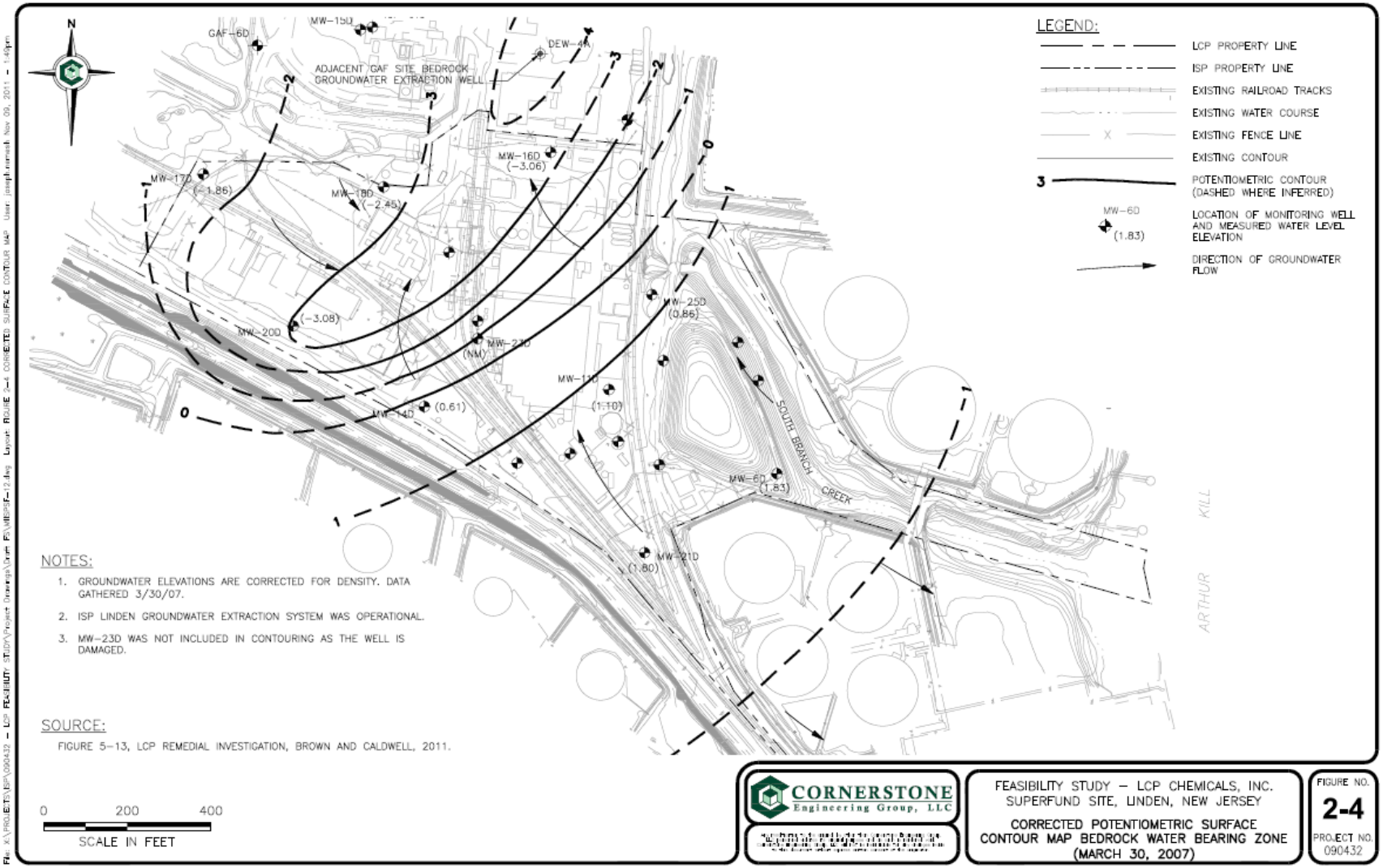
Overburden Groundwater VOC Concentrations



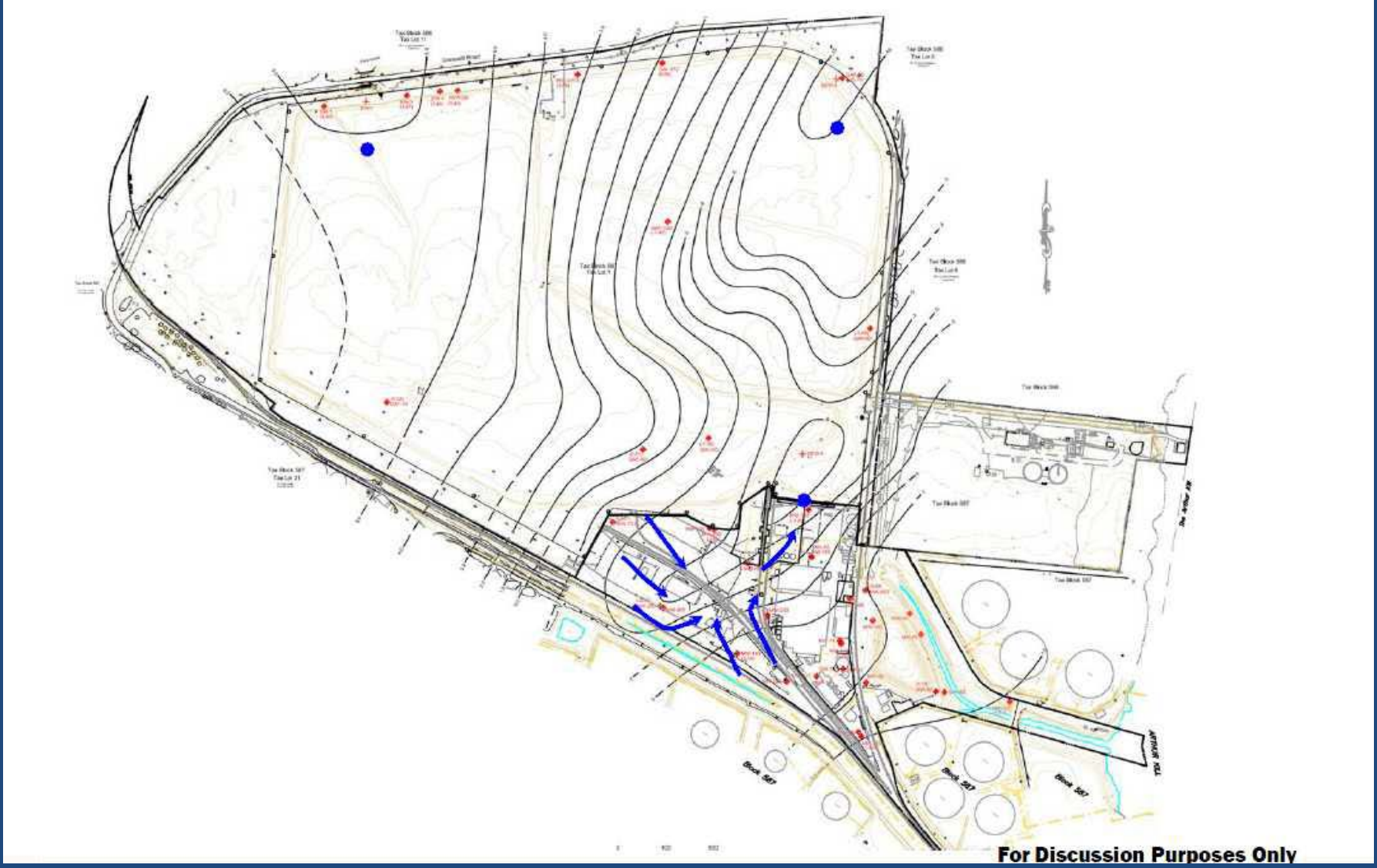
Bedrock GW Flow
GAF Extraction Not Operating



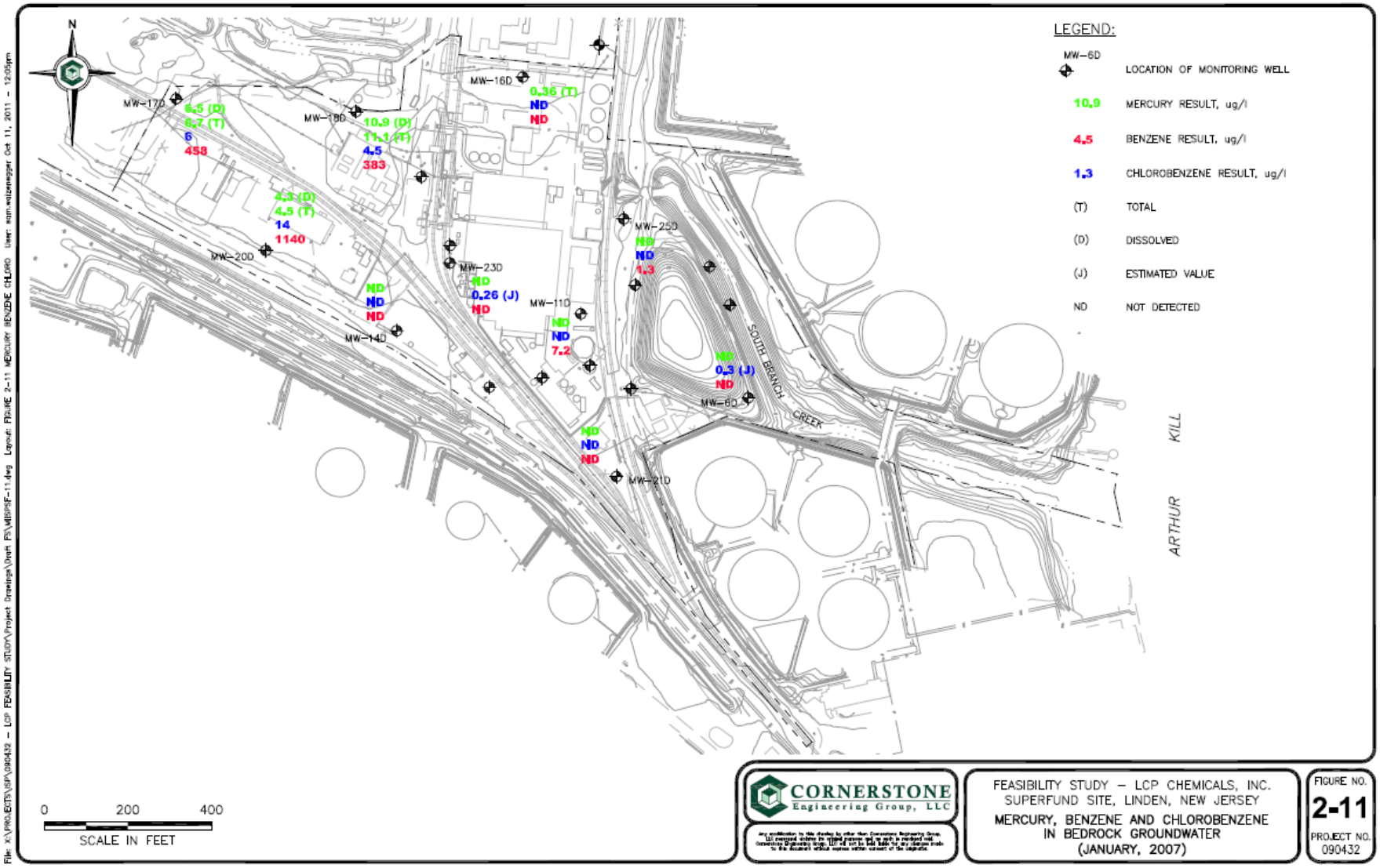
Bedrock GW Flow
GAF Extraction Operating



Bedrock Groundwater Flow
Extraction Well Operational



Bedrock Groundwater Mercury, Benzene and Chlorobenzene Concentrations



Buildings and Debris

- Approximately 250,000 cu yds of building space (~32,000 cu yds of material).
- Buildings unsafe to enter, assume porous material is heavily contaminated with Hg.
- Steel/cinder block construction.

Site Risks:

Human Health Risk: Potential exposure to soil and associated soil vapors and groundwater.

Ecological Risk: The principal eco risk is sediment in South Branch Creek, especially to benthic invertebrates.

Cumulative Human Health Risks

- Future Commercial/Industrial Workers
  Unacceptable cancer risks for soil & gw. RME 5.1×10^{-3} and CTE 1.6×10^{-3}.
  Unacceptable non-carcinogenic risk for soil & gw. HI for RME (190) and CTE (170).

- Future Construction/Utility Worker
  Unacceptable cancer risks for soil & gw. RME 5.1×10^{-3} and CTE 2.6×10^{-3}.
  Unacceptable non-carcinogenic risk for soil & gw. HI for RME (78) and CTE (39).

- Future Site-Specific Workers
  Unacceptable non-carcinogenic risk for soil. HI for RME (4.4) and CTE (1.5).

- Current/Future Trespassers
  Unacceptable non-carcinogenic risk for soil & sediments. HI for RME (1.4) .

04 11 2006 14:50

Ecological Risk Assessment

- Currently completed pathways exist.
- Principal ecological concerns are for benthic macroinvertebrates in SBC – primary risk drivers are mercury, arsenic and barium.
- SBC risks also exist for sediment probing birds – primary drivers are mercury, arsenic and barium.

Ecological Risk Assessment (cont.)

- Upland soils could pose a risk to insectivorous birds and mammals and carnivorous birds – primary drivers are mercury and hexachlorobenzene.

- Areas of visible mercury assumed to be a risk to all terrestrial wildlife.

Remedial Action Objectives
(Summary)

- Reduce or eliminate unacceptable human health and ecological risks from exposure to contaminants in soils, sediments, building debris and groundwater.

- Reduce or minimize migration of soil contamination to groundwater or surface water.

- Prevent or minimize migration of contaminated groundwater.

Screening of Soil Alternatives

- Cover
- Cap
- Excavation and Landfill Disposal
- Soil washing
- Vacuuming
- In-Situ Soil Flushing
- Thermal Desorption
- In-Situ Thermal Desorption
- Retorting
- In-Situ Vitrification
- Electrokinetic (EK) Separation
- Solidification
- In-Situ Solidification
- Stabilization
- In-Situ Stabilization
- Amalgamation
- Chemical Leaching
- Biological Treatment
- Phytoremediation

Soil Technologies Retained Through the FS

- Capping (with 6” treatment layer)
- Excavation and Landfill Disposal
- Stabilization

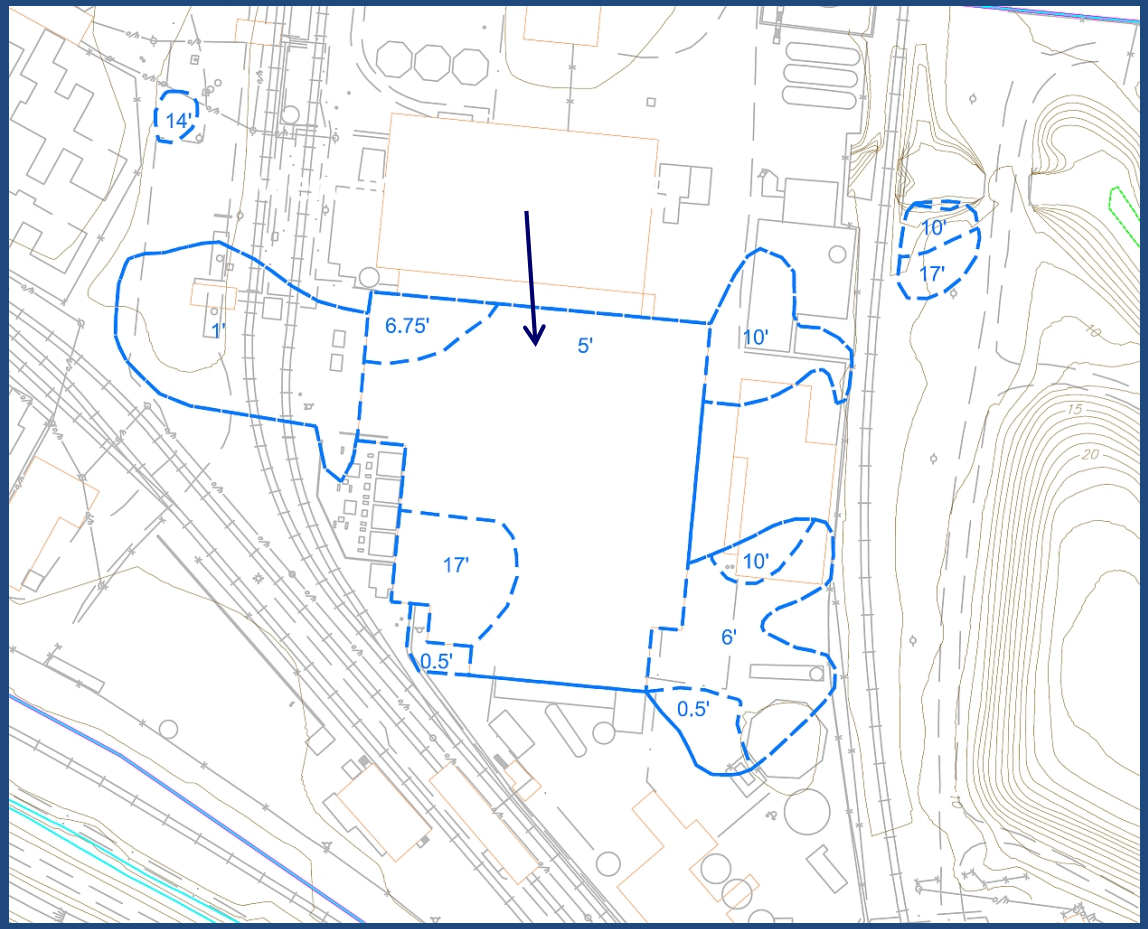
Review of Alternatives

- All four alternatives include:
  - building demolition
  - an impermeable cap and treatment layer
  - shallow groundwater collection
  - sediment excavation
  - wetland restoration
  - institutional controls
  - monitoring

Review of Alternatives (cont)

- Three of the alternatives include a vertical barrier wall
- One of the alternatives includes treatment of the soils with visible mercury (PTW)
- One of the alternatives includes excavation and disposal of the soils with visible mercury (PTW)

Visible Mercury Distribution



Depth Interval (FT)	Visible Hg Volume (CY)	Cumulative Soil Volume
0 – 1	3,600	16%
1 – 3	5,800	40%
3 – 6	8,700	77%
6 – 10	3,300	91%
10 – 17	2,200	100%
Total	23,600	

- **Alternative 2 – Cap**
- Total Capital Cost $ 19.9 million
- Operation and Maintenance $ 1.1 million
- Total Present Net Worth $ 21.0 million
- Timeframe >30 Years
-
- **Alternative 3 –Cap /Barrier Wall**
- Total Capital Cost $ 23.8 million
- Operation and Maintenance $ 1.1 million
- Total Present Net Worth $ 24.9 million
- Timeframe >30 Years
-
- **Alternative 4a – Cap/Barrier/ Partial Depth Stabilization**
- Total Capital Cost $ 33.2 million
- Operation and Maintenance $ 1.1 million
- Total Present Net Worth $ 34.3 million
- Timeframe >30 Years
-
- **Alternative 4b - Cap/Barrier/ Full Depth Stabilization**
- Total Capital Cost $ 35.2 million
- Operation and Maintenance $ 1.1 million
- Total Present Net Worth $ 36.3 million
- Timeframe >30 Years
-
- **Alternative 5a - Cap/Barrier/ Partial Depth Excavation Off-Site Disposal**
- Total Capital Cost $ 84.2 million
- Operation and Maintenance $ 1.1 million
- Total Present Net Worth $ 85.3 million
- Timeframe >30 Years
-
- **Alternative 5b - Cap/Barrier /Full Depth Excavation Off-Site Disposal**
- Total Capital Cost $ 96.2 million
- Operation and Maintenance $ 1.1 million
- Total Present Net Worth $ 97.3 million
- Timeframe >30 Years

Balancing Criteria

Alternatives 3, 4 and 5 will:

- Be Effective over the long-term
- Reduce Toxicity, mobility or volume of contamination
- Be Effective over the short-term
- Be implementable.

Stabilization vs Removal of PTW – Long Term Effectiveness

- Stabilization: Longevity of mercuric sulfide expected to be long-term.
- Removal: Will be permanent.

Removal.

Stabilization vs Removal of PTW –

Reduction of Toxicity, Mobility and Volume ("TMV")

- Stabilization: Mercuric sulfide is less toxic, less volatile and it's non-soluble. Up to 75% of visible mercury will be converted. Volume remains the same.

- Removal: Up to 100% of the PTW may be addressed.

Removal.

Stabilization vs Removal of PTW – Short Term Effectiveness

- Stabilization: Limited increase in mercury vapor generation (~1.0 pound during implementation). Minimal risk to community. Minimal risk to workers. Timeframe 3-4 years (includes pilot study).

- Removal: Potential for large increase in vapor generation (~200 lbs). Increased risk to workers due to mercury vapor. Increase risk to community due to vapor generation and transportation of waste. Timeframe 1-2 years.

Stabilization.

Stabilization vs Removal of PTW – Implementability

- Stabilization: Will need a pilot and treatability study. Will need some specialized equipment for soil mixing. Subsurface obstructions could slow remedy.

- Removal: Limited options for soil disposal will require export of soil to a Canadian facility. Mercury export ban applies if facility removes mercury before landfilling soil. Subsurface obstructions could slow remedy.

Stabilization.

Stabilization vs Removal of PTW –

Total Alternative Net Present Worth Cost

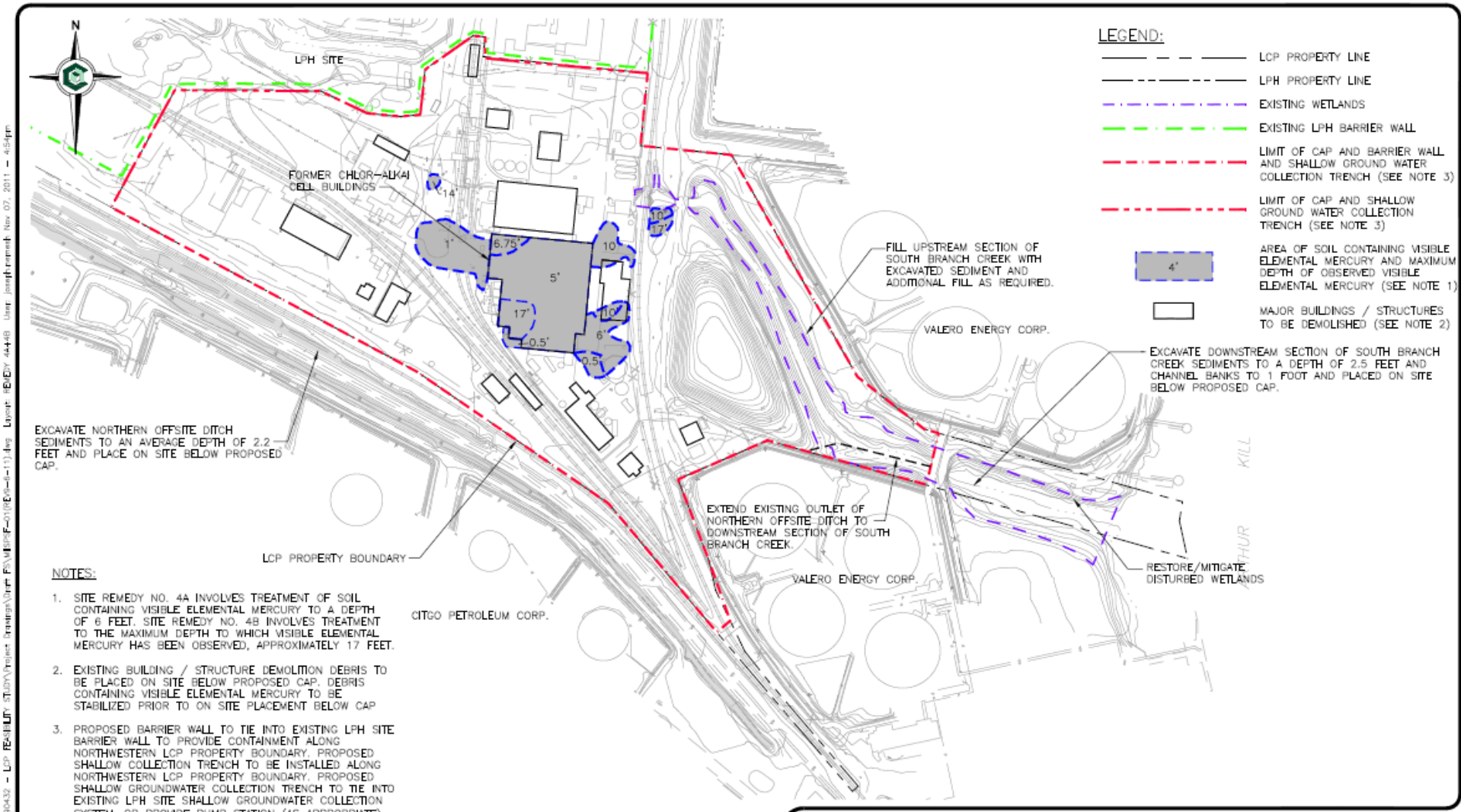
- Stabilization: $36.3 million.
- Removal: $97.3 million.

Stabilization.

Region 2's Preferred Remedy

Alt 4b – Full Containment and Full Depth Stabilization

- 24 Acre Impermeable Cap with a 6" Sulfur Treatment Layer
- Full Depth stabilization of soil containing visible mercury (i.e., PTW)
- 3,900 linear Foot Barrier Wall Tied into the Top of the Glacial Till Layer
- Shallow GW Collection and Treatment at Sewage Treatment plant
- South Branch Creek (and Northern Off-Site Creek) Sediment Excavation, On-Site disposal, Wetlands Restoration;
- Building Demolition, Recycle Steel and On-Site Disposal of Porous Material



NOTES:

1. SITE REMEDY NO. 4A INVOLVES TREATMENT OF SOIL CONTAINING VISIBLE ELEMENTAL MERCURY TO A DEPTH OF 6 FEET. SITE REMEDY NO. 4B INVOLVES TREATMENT TO THE MAXIMUM DEPTH TO WHICH VISIBLE ELEMENTAL MERCURY HAS BEEN OBSERVED, APPROXIMATELY 17 FEET.
2. EXISTING BUILDING / STRUCTURE DEMOLITION DEBRIS TO BE PLACED ON SITE BELOW PROPOSED CAP. DEBRIS CONTAINING VISIBLE ELEMENTAL MERCURY TO BE STABILIZED PRIOR TO ON SITE PLACEMENT BELOW CAP
3. PROPOSED BARRIER WALL TO TIE INTO EXISTING LPH SITE BARRIER WALL TO PROVIDE CONTAINMENT ALONG NORTHWESTERN LCP PROPERTY BOUNDARY. PROPOSED SHALLOW COLLECTION TRENCH TO BE INSTALLED ALONG NORTHWESTERN LCP PROPERTY BOUNDARY. PROPOSED SHALLOW GROUNDWATER COLLECTION TRENCH TO TIE INTO EXISTING LPH SITE SHALLOW GROUNDWATER COLLECTION SYSTEM, OR PROVIDE PUMP STATION (AS APPROPRIATE).

CORNERSTONE Engineering Group, LLC

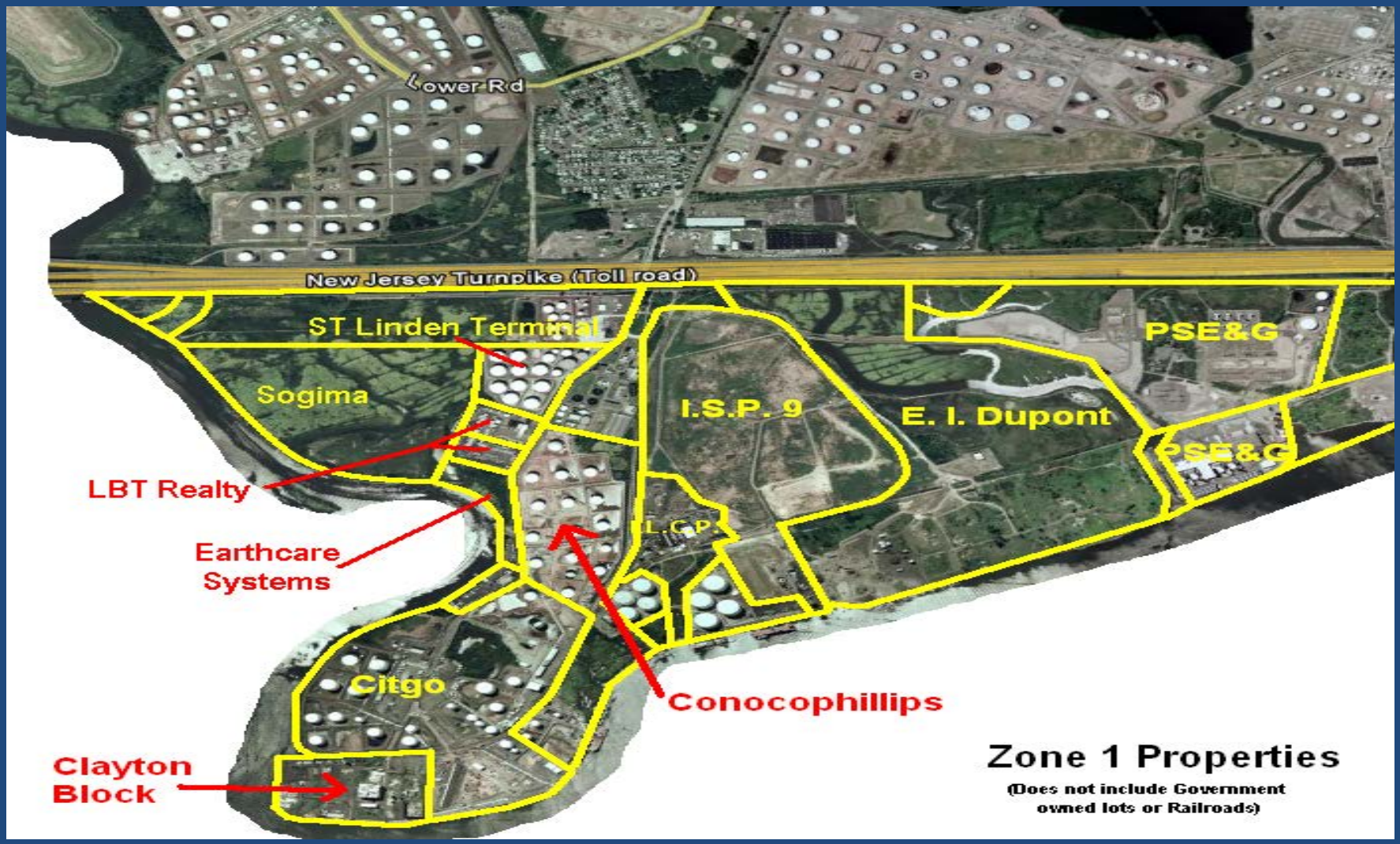
FEASIBILITY STUDY – LCP CHEMICALS, INC.
SUPERFUND SITE, LINDEN, NEW JERSEY
SITE REMEDY NOs. 4A & 4B
FULL CONTAINMENT AND
SELECTIVE STABILIZATION

FIGURE NO.
7-3
PROJECT NO.
090432

Contingency Remedies

- If the preferred remedy fails to meet design specifications one of two contingencies will be implemented:
    - Alternative 4a
    - Alternative 3

Linden Tremley Point Area



Linden Tremley Point Area

Tremley Point Total Acres
Properties Located East of NJ Turnpike Authority
Properties Designated for Development/For Sale

Block	Lot	Zone	Property Location	Owners Name	Acres	Status
587	8	1	4900 TREMLEY PT RD	CLAYTON BLOCK	**24**	FS/UC
587	11	1	Consolidated Property	E I DUPONT DE NEMOURS & CO PROP TAX	**211**	FS/UC/LDA
586	1	1	S E OF TURNPIKE	ISP 9 CORP	**143**	FS/LDA
587	3.2	1	BETWEEN GAF & LCP	LCP CHEMICALS & PLASTICS, INC	**26**	FS
587	16	1	SNG PLANT	PSEG POWER/FOSSIL LLC	**13**	FS
587	14	1	4700 TREMLEY PT RD	TREMLEY POINT INDUSTRIES C/O M DOTRO	**6**	FS
587	15	1	4400 TREMLEY PT RD	PMJ CAPITAL CORP	**9**	FS
587	16	1	4050 TREMLEY PT RD	SOGIMA L-A HARBOR LLC C/O YELLOW PAD 87 Acres	**7**	FS
587				**Total Acreage In Development or For Sale**	**439**	

Legend :FS= For Sale, UC= Under contract, LDA= Linden Designated Development Area

❖There is currently 439 Acres in the process of development or on the market for sale.

- PureGen is under Contract with DuPont.
- Clayton in Contract talks with BioFuel and Metal Recycling Business.
- ISP is in discussion with various warehousing businesses.
- Linden Chlorine Products is in demand for petro storage & truck parking.
- PSE&G Installed a 13 acre Solar Panel Farm.
- PMJ & Sogima properties are in the market for sale.

DELINEATION OF A POTENTIAL GASEOUS ELEMENTAL MERCURY EMISSIONS SOURCE IN NORTHEASTERN NEW JERSEY

SNJ-DEP-SR11-018

PIs: John R. Reinfelder (Rutgers University), William Wallace (College of Staten Island)

Final Report
February 2013

Summary

In order to assist in the identification of a potential mercury (Hg) emissions source in northeastern New Jersey, this project was undertaken to delineate geographic areas in which this source may be located. To this end, the objectives of this project were to collect gaseous elemental mercury (GEM) concentrations at a site to the east of the putative emissions source on Staten Island, New York and analyze these results with those collected by the NJDEP at their air monitoring site (ELAB) in Elizabeth, New Jersey. Additional local measurements were to be obtained near possible emissions sources. From September 30, 2011 to September 3, 2012, more than 200 days of GEM data were collected at the Staten Island site and together with wind speed and direction data from the NOAA Bergen Point West Reach naval observatory station were analyzed for source trajectories of GEM in the region. GEM concentration and wind direction data from the ELAB site for the same period of time were also analyzed. Local scale measurements of GEM were limited by access to appropriate sites and difficulties maintaining stable calibration of the portable Hg analyzer.

Directional analysis of the number frequency and concentration-weighted distributions of GEM peaks with concentrations >4 ng m^{-3} at the ELAB site revealed a single source direction just east of south (bearing 173.4°). Similar analysis of GEM results for the Staten Island site revealed two source directions, one to the west (bearing 280.5°) and a second to the southwest (bearing 213.8°). The intersections of the two Staten Island trajectories with the ELAM trajectory delineate two possible GEM source areas. The first is centered in Rossville, NY on Staten Island (40.5514 N, 74.1947 W) and the second near Pralls Island in the Arthur Kill along the eastern border of Linden, NJ (40.6119 N, 74.2039 W). Temporal analysis of GEM peaks for the three source directions indicates that the eastern Linden source may contribute more GEM to elevated measurements recorded in Elizabeth than the Rossville source.

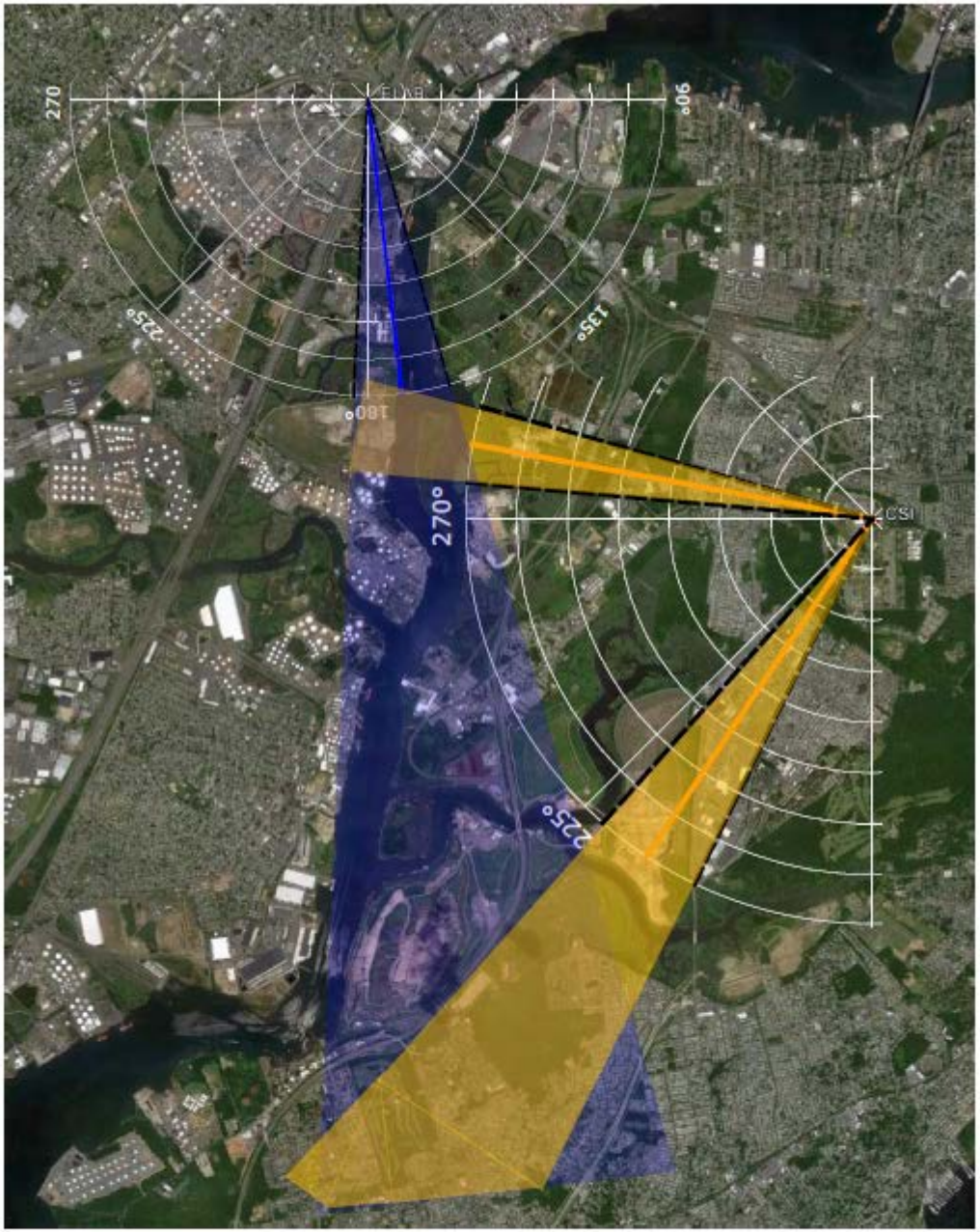


Figure 13. Directional bearings of possible GEM emission sources to monitoring sites in Elizabeth, New Jersey (blue cone) and at the College of Staten Island, New York (orange cone). Directional bearings were defined by the mean (solid lines) and 95% confidence intervals (dashed black lines) of the Gaussian model fits for each GEM peak cluster.

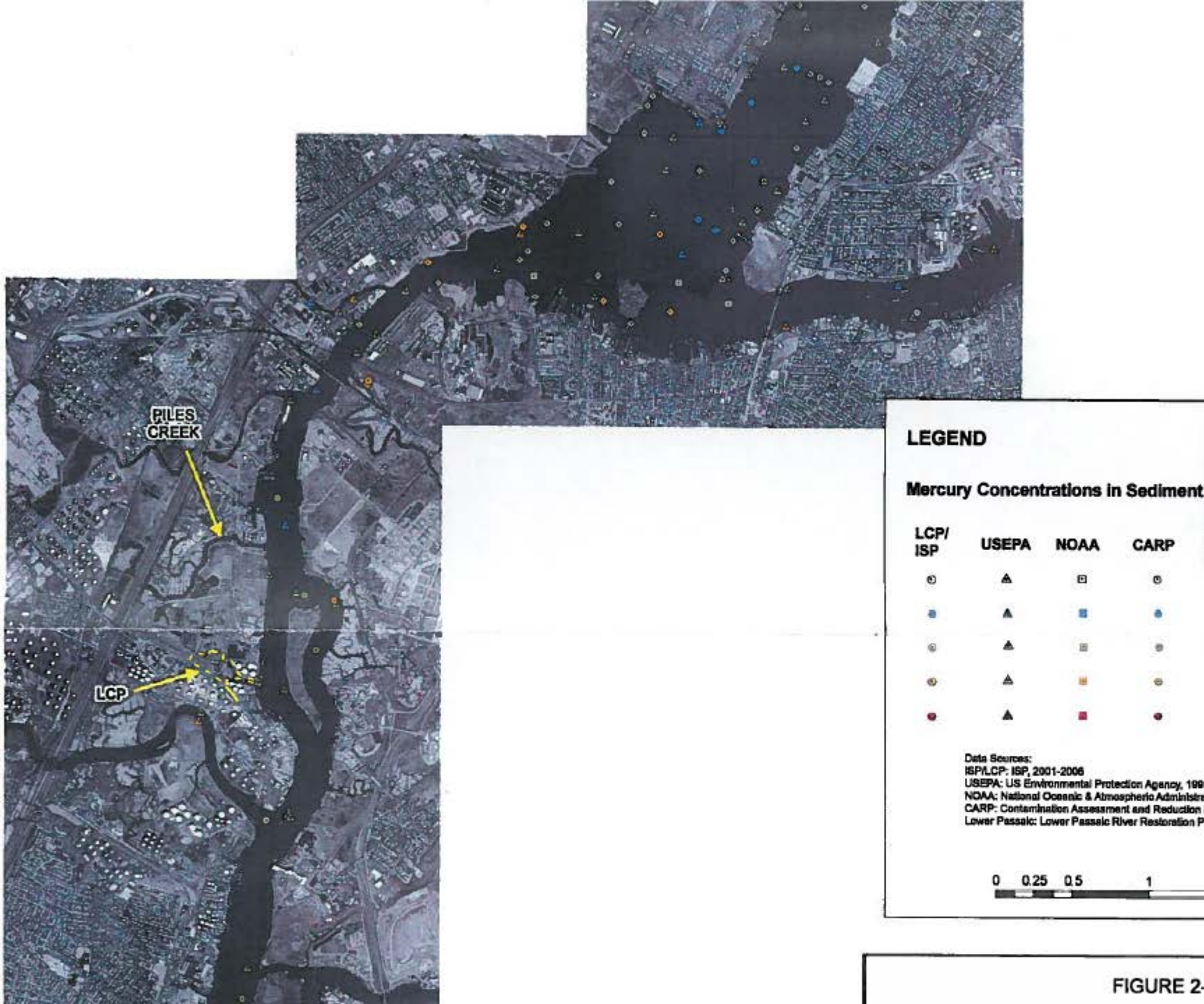
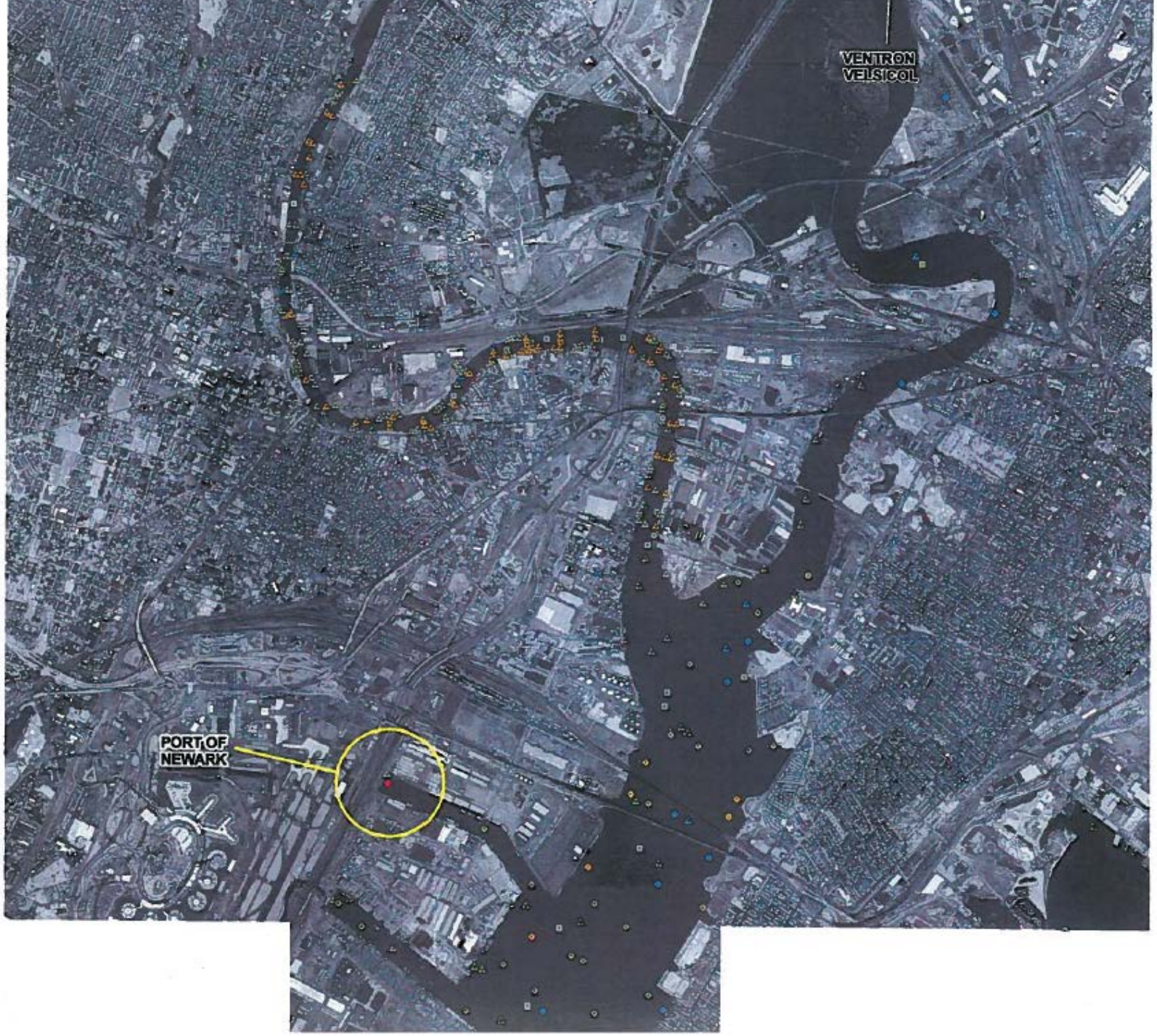

PILES CREEK
LCP
LEGEND
Mercury Concentrations in Sediment
LCP/ ISP
USEPA
NOAA
CARP
Data Sources:
ISP/LCP: ISP, 2001-2006
USEPA: US Environmental Protection Agency, 199
NOAA: National Oceanic & Atmospheric Administra
CARP: Contamination Assessment and Reduction
Lower Passaic: Lower Passaic River Restoration P
0 0.25 0.5 1

FIGURE 2-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